

A Review of Topics and Trends Across Five Decades of Coastal Management Journal

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This paper provides an analysis of the topics covered by Coastal Management Journal (CMJ) over the course of its nearly five decades of publication. The analysis looks for trends and changes in the field of Coastal Management across topics and categories (groups of topics) that have been published by CMJ. It identifies geographical locations (at the state, national, regional and international levels) that have been mentioned by papers published in CMJ and identifies changes in geographical representation over time. The research was conducted using a mix of literature review techniques that helped identify emergent topics found within the titles and abstracts of CMJ papers. CMJ was founded within a year of the passage of the 1972 Coastal Zone Management Act. It has been a respected platform within the field of Coastal Management for five decades during which time the concept has been applied at the policy level within the United States and adopted into practice by many nations and intergovernmental organizations around the world. CMJ has also adapted its response to changing coastal management issues and the change in the needs of coastal management practitioners over the course of its publication history. Throughout its 47-year publication history CMJ has significantly increased its international representation and scope and has seen a number of changes in terms of topic representation. These include a substantial increase in the number of Climate Change and Sea Level Rise papers that it has published, as well as an increase in the number of papers it has published that focus on the importance of Marine Protected Areas. The most common topics published within the pages of CMJ are related to Policy, Planning, Protection and Economics, while the largest category of identified topics contains those that are related to Human Dimensions.

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Abstract

This paper provides an analysis of the topics covered by Coastal Management Journal (CMJ) over the course of its nearly five decades of publication. The analysis looks for trends and changes in the field of Coastal Management across topics and categories (groups of topics) that have been published by CMJ. It identifies geographical locations (at the state, national, regional and international levels) that have been mentioned by papers published in CMJ and identifies changes in geographical representation over time. The research was conducted using a mix of literature review techniques that helped identify emergent topics found within the titles and abstracts of CMJ papers. CMJ was founded within a year of the passage of the 1972 Coastal Zone Management Act. It has been a respected platform within the field of Coastal Management for five decades during which time the concept has been applied at the policy level within the United States and adopted into practice by many nations and intergovernmental organizations around the world. CMJ has also adapted its response to changing coastal management issues and the change in the needs of coastal management practitioners over the course of its publication history. Throughout its 47-year publication history CMJ has significantly increased its international representation and scope and has seen a number of changes in terms of topic representation. These include a substantial increase in the number of Climate Change and Sea Level Rise papers that it has published, as well as an increase in the number of papers it has published that focus on the importance of Marine Protected Areas. The most common topics published within the pages of CMJ are related to Policy, Planning, Protection and Economics, while the largest category of identified topics contains those that are related to Human Dimensions.

Introduction

Upon its inception in 1973, founding Editor-In-Chief Marc J. Hershman stated his intention for Coastal Zone Management Journal (CZMJ) to be “a forum for the presentation and discussion of ideas, proposals and findings relating to the coastal resources of this nation [the United States].” CZMJ was a response to the Coastal Zone Management Act of 1972, in which Congress “recognized the importance of meeting the challenge of continued growth in the coastal zone,” understanding a need to “preserve, protect, develop, and where possible, to restore or enhance” the resources found within the coastal zones of the United States. As Hershman stated in his Editorial Prologue published in the journal’s premiere issue, “If coastal zone management is to work, new ideas, institutions and methodologies are needed.”

Since 1973, Coastal Zone Management Journal (hereinafter Coastal Management Journal or CMJ, as it was renamed in 1987)) has published a total of 1,302 papers, covering coastal- and management-related topics from sixty-four countries and sixteen distinct geographical regions across the globe. Within the United States, CMJ has published papers related to coastal management issues specific to twenty-three states, plus an additional four U.S. territories and

six distinct geographical regions. A total of 118 emergent topics were identified within the Coastal Management field based on the titles and abstracts of the articles published within the pages of CMJ. These were then employed to analyze trends throughout the publication history of CMJ.

Trends in the frequency of the publication of articles on these topics show shifts over time. Even the term “Coastal Zone Management” itself has become increasingly less common, being replaced by “Coastal Management” and “Integrated Coastal Management”. This paper provides a history of the field of Coastal Management, a history of Coastal Zone Management Journal/Coastal Management Journal, and a discussion of trends among the 1,302 papers that have been published within CMJ over its 47-year history.

Background: A Short History of Coastal Management and the Coastal Zone Management Act

The 1972 U.S. Congress recognized the need to protect and properly manage the immense growth that America was seeing along its coastal borders. Members of Congress had become increasingly concerned with “competing demands upon the lands and waters of our coastal zone.” They were particularly worried about demands associated with a growing population and growing economic development, as well as strains put on the coastal zone by various industries, residential and recreational needs, extractive resources, transportation and navigation, waste disposal, the fishing industry, ecological changes and shoreline erosion. For these reasons, Congress stated that “there is a national interest in the effective management, beneficial use, protection, and development of the coastal zone” (16 U.S.C. 1451. Congressional Findings, Section 302).

Congress passed the 1972 Coastal Zone Management Act (CZMA) that provided the framework for a National Coastal Zone Management Program (NCZMP), set up a National Estuarine Research Reserve System and established the Coastal and Estuarine Land Conservation Program (CELCP). The goal of the NCZMP was to “balance competing land and water issues through state and territorial coastal management programs”; the estuarine reserve system is intended to act as “field laboratories that provide a greater understanding of estuaries and how humans impact them”; and the CELCP provides the funds that local and state governments need to purchase threatened areas or undertake conservation-related projects (NOAA, 2019).

The enactment of Coastal Management policies in the United States came a full two decades before the United Nations helped to popularize the concept of “Integrated Coastal Zone Management” (ICZM) at the 1992 Earth Summit in Rio de Janeiro. According to the Food and Agriculture Organization of the United Nations, the majority of nations across the globe would not begin to undertake their own Integrated Coastal Management (ICM) projects until the mid-1990s (FAO Legislative Study 93).

In the U.S., Washington became the first state to adopt the CZMP, doing so in 1976 (Department of Ecology, State of Washington, 2015). Of the 35 states and territories that are eligible to be in the program (those with an ocean or Great Lakes coastline). More than half of

the states and territories currently in the program had joined by the time the 1970s (NOAA, 2019) came to a close, allowing them to receive federal funding to implement the Act and its goals. The last state to join (Illinois) did not do so until 2012 (Illinois Prairie Research Institute, 2019). Alaska is the only state to have withdrawn from the program, doing so in 2011, after 32 years of participation (Federal Registrar, 2011).

The need to properly “manage” and protect the world’s coastal regions is seen as critical to economic development and growth, as well as the health of both human beings and the environment because an estimated 2.4 billion people live within 100 kilometers (60 miles) of an ocean-based coast. That represents a full 37% of the global human population. The United Nations estimates that the ocean-related economy is worth somewhere between \$3-6 trillion each year (The Ocean Conference, United Nations, 2017).

History of the journal

In his Editorial Prologue to the first issue of CMJ, founding Editor-In-Chief Marc J. Hershman referred to Coastal Zone Management (as a field) as being a national challenge that he projected would last for decades. He also specifically asked “How do we assess coastal zone impact? How do we measure the immeasurables of aesthetics, scenic qualities and quietude?” and “How do we determine the desires of the people?” implying that the concepts covered in his new journal were going to be both interdisciplinary and broad.

Hershman also mentioned the work already being done in the field by “physical, biological, engineering and social science” practitioners, as well as by government officials, politicians, and lawyers, giving his first readers a glimpse into just how many fields of research, areas of study and forms of practice would wind up using CZMJ to publish their work in the decades to come. He stated his hope that his journal would help to create “avenues for cross-discipline exchange” that he saw as lacking in the field at the time.

While Hershman’s Prologue was written with a specific focus on coastal management issues within the United States, by its third issue during its first year in publication, CZMJ published a paper titled *Coastal Land Management in New Zealand* (Chapman, 1974), and its first issue during its second year featured a paper titled *Coastal Land Use Control in Sweden* (Hildreth, 1975), demonstrating that the scope that Hershman had in mind would be relevant to many countries around the world.

Hershman was a giant in his field. He was only 29 in 1973 when he founded CMJ while on faculty at Louisiana State University. Three years later, he moved the journal to the University of Washington (UW) when he took a job at the Institute for Marine Studies. He also founded a Washington-state-based maritime museum, served as the director of UW’s School of Marine Affairs for ten years, and served on the U.S. Commission on Ocean Policy, appointed by President George W. Bush (Perry, 2008). He was an active member of The Coastal Society (TCS), an “organization of private sector, academic, and government professionals and students... dedicated to actively addressing emerging coastal issues by fostering dialogue, forging

partnerships and promoting communications and education" (The Coastal Society, 2019). TCS hosts international conferences and is currently (as of 2009) the affiliated organization for Coastal Management Journal.

Hershman served as a mentor to current Editor-In-Chief Patrick J. Christie, who did his postdoctoral work with Hershman at the University of Washington. Christie took over the Editor-In-Chief role at CMJ upon Hershman's death in 2008.

In 1972, B. H. Ketchum defined the "Coastal Zone" as "The band of dry land and adjacent ocean space (water and submerged land) in which terrestrial processes and land uses directly affect oceanic processes and uses, and vice versa" Kay and Alder (2005) state that a key element in this definition is the "interaction between oceanic and terrestrial processes and uses." According to a common dictionary, the term Management means "the process of dealing with or controlling things or people."

The terms Coastal Management, Coastal Zone Management, or Integrated Coastal (Zone) Management mean slightly different things depending upon geographic location and/or the entity or organization defining them. In the United States, the National Oceanic and Atmospheric Administration (NOAA) defines Coastal Zone Management as involving the management of "coastal areas to balance environmental, economic, human health, and human activities" (NOAA, 2019). In the European Union, Integrated Coastal Management "aims for the coordinated application of different policies affecting the coastal zone and related to activities such as nature protection, aquaculture, fisheries, agriculture, industry, off shore wind energy, shipping, tourism, development of infrastructure and mitigation and adaptation to climate change" (The European Union, 2019). Australia defines Integrated Coastal Zone Management as "the process for managing all coastal issues in a framework integrated across biota and habitats, time and space, and levels of government" (Clark and Johnston, 2016). While the United Nations' Food and Agriculture Organization sees Integrated Coastal Management as "a dynamic process by which actions are taken for the use, development and protection of coastal resources and areas to achieve national goals established in cooperation with user groups and regional and local authorities" (FAO Legislative Study 93).

CMJ sets its aim and scope at a combination of all of the above definitions, stating that it is "dedicated to exploring the technical, applied ecological, legal, political, social, and policy issues relating to the use of coastal and ocean resources and environments on a global scale" (Taylor & Francis Online, 2019).

Methods

This research analyzes the titles and abstracts that make up the publication history of the journal, looking for recurring topics. It seeks to identify trends among the topics of papers published. Titles and abstracts of all 1,302 published papers (excluding book reviews, editorial notes and brief introductions that do not constitute complete papers) were used to define the topics that have been covered by Coastal (Zone) Management Journal. This undertaking is a

combination of a title analysis and a review of abstracts, modeled after the concept of a Literature Review.

The concept of a "Literature Review" is defined differently by different institutions. The University of North Carolina at Chapel Hill (2019) says that "a literature review discusses published information in a particular subject area, and sometimes information in a particular subject area within a certain time period." The University of Wisconsin-Madison (2019) states that "the purpose of a [literature] review is to analyze critically a segment of a published body of knowledge through summary, classification, and comparison of prior research studies, reviews of literature, and theoretical articles." The University of California at Santa Cruz (2019) defines a literature review as one that "surveys scholarly articles, books and other sources relevant to a particular issue, area of research, or theory, providing a description, summary, and critical evaluation of each work."

This assessment of CMJ topics and trends uses the broad concept of a Literature Review as a starting point for analyzing the topics that have been published in the journal, by first identifying topics based on the paper titles, and then further review of paper abstracts if the titles were too vague from which to discern a topic(s). Once the topics were identified (a total of 118), the papers were then grouped by topic into nine distinctive topic Categories, based on topic similarities (i.e. how closely these topics were related to one another). An additional two categories were created related to geographical location (those two categories are International and U.S.), in order to determine how topics have changed over time and location, allowing for an analysis to be done relating to trends in the field of Coastal Management, as represented by the publication history of CMJ. A similar analysis was recently conducted by Smith and Jaleel (2019) titled *Marine Policy: The First Four Decades*, in which the authors identified and analyzed the major themes published in *Marine Policy* throughout its publication history, which dates back to 1977.

For the purposes of this research the term "Topic" is defined in its most general, dictionary-definition form: "a matter dealt with in a text, discourse or conversation." In order for a "topic" to meet the threshold of being considered a matter that was "dealt with" within each individual paper, the repeated word, term or concept in question that makes it onto the list of topics analyzed must have been either a main focus or one of several key points mentioned within the paper's title or abstract. Each topic must be identified within a minimum of two papers in order for it to be identified as a topic listed within this paper. Topics that were identified only once were not included. Furthermore, this paper defines Category as a group of topics that are similar to one another or that have similarities within their specific scopes or definitions. Trend or Trends are defined as a change over time. That change can refer to a change in frequency of publication of a topic across time or geographically, as well as a combination of the two. Many of the topics that emerged from this research have increased or decreased in popularity or importance, either over time or location.

The majority of titles published by CMJ are fairly detailed descriptions of paper content, thus accurately portraying their topic(s). For example: A paper titled *Humpback Whales in Tonga: An*

Economic Resource for Tourism (Orams, 2002) is about the economic impact that humpback whales have on the tourism industry in the island nation of Tonga. That paper is, therefore, placed into the topics of Whales, Tonga, Economics and Tourism. Furthermore, a paper titled *The Lost Waterfront of New York* (Moss, 1979) is about waterfront in New York City; it is placed under the topics of Waterfront and New York. A paper titled *Assessing the Impacts of Gender Integration in Ghana's Fisheries Sector* (Torrell et al., 2019) falls under three topic categories, because it is about Gender (in this case women; there has not been a paper published by CMJ that has used the term "gender" to imply men), Ghana and Fisheries.

There are, of course, titles that are less clear. *Old Woman Creek, Ohio: The Designation of a Freshwater Estuarine Sanctuary* (Hanselmann and Vogel, 1978) falls under the topics of Estuary, Sanctuary and Ohio, but it also falls under a broader heading of The Great Lakes, about which CMJ has published a total of 19 papers. This paper does not fall under a heading of "Freshwater" because of the 1,302 published papers, this is the only paper that contains the word "freshwater" within its title, so "Freshwater" is not an identified topic among papers published by Coastal Management Journal. Furthermore, "Freshwater" as a topic within the field of Coastal Management would refer to either a lake or river. Within the confines of this research, "River" is an identified topic, listed separately from the topic of "Estuary". However, "Lake" is not an identified topic, because all the lake papers published by CMJ have been specific to lakes that are a part of the Great Lakes maritime system. Therefore, the only topics that have been identified referring to freshwater systems are "Great Lakes" and "River."

Another example of a title not telling the entire story would be that of *Salt Marsh Restoration and the Shellfishing Industry: Co-evaluation of Success Components* (Castagno, 2018). Upon inspection of the paper's abstract, the focus of the paper is about more than "marsh" land, "restoration" and shellfish. It is also a paper about Ecosystem Services (as stated in its abstract, but not its title), as it is about the impact that restoring salt marshes has on the shellfish industry that exists around Cape Cod, Massachusetts. Therefore, the topics that this paper falls under are those of Marsh, Restoration (or Restore), Shellfish, Ecosystem Services and Massachusetts.

As stated above, implied within the scope of Coastal Management Journal are the very broad concepts of Coastal Management (CM), Coastal Zone Management (CZM), Integrated Coastal Management (ICM) and Integrated Coastal Zone Management (ICZM). It is implied by the scope of this journal that each paper has something to do with the Coast or Coastal Zone, and with the concept of Management. For this reason, the Coast or Coastal Zone, as well as the term Management are not included within the identified topics, because they should, theoretically, be able to be applied to every paper. For example: a paper titled *Response of Coastal Zone Management Programs to Sea Level Rise in the United States* (Klarin and Hershman, 1990) falls into the topic categories of Sea Level Rise and United States (but not within Coastal Zone Management).

However, a topic heading for CZMA and other Coastal-Zone-related laws and policy considerations was identified to encompass papers that are about broad Coastal Zone

Management ideas AND that did not fall into any other of the identified topics. This broad CZMA and Coastal Management laws topic heading includes a total of 36 papers. Examples of these papers include: *Simple Information Systems for Coastal Zone Management* (Weyl, 1981-1982), *CZM: The Tiger Needs Some Teeth* (Schultz, 1979) and *National and International Efforts at Integrated Coastal Management: Definitions, Achievements, and Lessons* (Sorensen, 1997).

Papers that pertain to a specific geographical location are listed under those locations at either the state, national or regional levels; topics or categories were not created to pertain to more localized areas such as cities. Papers whose abstracts identify a location as being an important part of the focus of the paper were also listed under the associated topic heading of that particular location, even if the location name did not appear within the title. However, papers that mention a specific location within their abstract (and not within their title) but that do not focus their research on that location are not listed under that location within the category. For example, *Information Utilization and Self-Evaluating Capacities for Coastal Zone Management Agencies* (Rosentraub and Warren, 1975-76) looked at data from coastal development issues in the State of California, but the focus of their paper was not on California itself, but rather to use California data as an example of how to develop the field of Coastal Management on a broader scale. For this reason, the Rosentraub and Warren paper does not fall under any topic heading, other than that it is considered to be a broad "Coastal Management" paper that falls under the previously-mentioned CZMA-related topic heading. Because the focus of the paper is not directly centered around California, it also does not fall under any location-based category.

The majority of the topics identified correlate directly to a specific word, which has its own unique meaning that is different enough from the meanings of other words to render it its own unique topic. On a few occasions, however, multiple, similar words were combined under a single topic. For example, law and legal are considered to be of the same topic; as are urban and metropolitan; as well as opinion(s), perception(s) and attitudes (when pertaining to research that involved survey work); coral and coral reef(s) are considered to be one topic; oil, gas and petroleum are also synonymous; climate change and global warming are considered to be interchangeable; and resort, vacation and visit are also concepts that are grouped together as a single topic that relates to how tourists partake in the tourism industry.

It is also critical to differentiate between differing topics when specific words are orthographically repeated. An example of this would be with the word "Ecosystem." As a topic, "Ecosystem" (referencing the concept of a biological community of interacting organisms and their physical environment) appears 26 times. Those 26 identifications do not include references to "Ecosystem-Based Management" (or "Ecosystem-Based Fisheries Management") which has a separate meaning from "Ecosystem." "Ecosystem-Based Management" is identified a total of fifteen unique times. Both of those ecosystem-related topics are also counted separately from the topic of "Ecosystem Services," which is another example of a unique theme that contains the word "ecosystem" within its name, but that has its own unique meaning. As a topic, Ecosystem Services is identified a total of ten times.

Similarly, related topics such as "River" and "Estuary" are not cross-identified. The five identifications for "River" are not included within the 42 identifications for "Estuary" and vice versa. A more frequent example, i.e., papers that are identified as being about "Climate Change" or that include the term "Warming" are not included within the accounting for "Sea Level Rise" papers. While sea level rise is a result of climate change (NASA, 2019), the 22 papers that are identified as being about "Climate Change" are broader than the 28 papers that specifically identified their focus as being about a rise in sea levels.

Topic groups as small as those containing only two published papers are listed among the 118 identified topics. Topics that only contain one published paper are not considered a topic. For example, CMJ has only published one paper about the Sea Grant program, so "Sea Grant" is not considered to be a topic. Similarly, only one paper has been published that focuses on seals (the marine mammal), so "Seal" is not a topic identified within this research. Neither is the term "Hatchery" considered to be a topic, with only a single published paper.

This paper is a review and analysis based upon words describing content within paper titles or if necessary, a more detailed examination of paper abstracts. The limitations of this study center around human error. It is reasonable to expect bias and error to creep into the topic identification process, especially if a potential topic is mentioned within the abstract of a paper, but not within the paper's title itself. In that instance, the author would likely fail to identify or count all necessary topics. All 1,302 paper titles were analyzed, but only approximately one-third of the corresponding abstracts (which does not include all 1,302 published titles, as book reviews, general comments and broad introductions were excluded) were analyzed to ascertain the themes and focus of each paper.

It is also conceivable that not all geographical locations were identified, especially if the location was not in the title and mentioned only in the paper's abstract. It is also reasonable to assume that a few potential minor topics (those that might pertain to a small number of papers) are also overlooked and not listed as a topic.

It is also possible that errors exist based upon how topics related to Coastal Management (as a field) are defined by others. The likelihood of a mis-categorization or of a misunderstanding of topic might be increased if the author of a published paper is from a different geographical region and/or culture from the author of this paper.

Results

A total of 118 unique topics are identified over CMJ's publication history (See Table 1). Thirteen of those topics are associated with only two published papers each. These include: Lobster, Mangroves, Sharks and Shrimp, plus more human-dimensions-based topics, including Religion and the concept of considering "Future Generations" within the scope of Coastal Management. 92 of the 118 identified topics are each identified with a total of 20 published papers or fewer, while thirteen have been identified with a minimum of 30 published papers. These more popular topics include: Policy/policies (associated with 78 papers); Economics (70 papers);

Marine Protected Areas or MPAs (62 papers); Fisheries (60 papers); Beach(es) (59 papers); Planning (59 papers); Development (56 papers); Community (52 papers); Coral, Coral Reefs or Reefs (46 papers); Estuary or estuaries (42 papers); Opinion(s), Perception(s) and Attitude(s) (38 papers); CZMA or other Coastal-Management-related broad legal and policy papers (a total of 36 papers); and Governance (35 papers).

Table 1- Topics Covered in CMJ Articles Ranked by Frequency of Publication

Policy/policies- 78	Habitat- 18	Waterfront- 8	Surf(er)- 4
Economics- 70	Participation- 18	Dredging- 7	Women/gender- 4
MPAs- 62	Spatial- 18	Expert- 7	Agriculture- 3
Fisheries-60	Tourism- 18	Government- 7	Armoring- 3
Beach(es)- 59	Act(s)- 17	Heritage- 7	Bird(s)- 3
Planning- 59	Energy- 16	Islands- 7	Communication- 3
Development- 56	Ship/shipping- 16	Political/politics-7	Crabs- 3
Community- 52	Vulnerability- 16	Turtle- 7	Culture- 3
Coral/Coral Reefs- 46	Access- 15	Waste/wastewater- 7	Geography- 3
Estuary(ies)- 42	EBM/EBFM- 15	Cost- 6	Lagoon- 3
Opinion/Attitudes-38	Erosion- 15	Dunes- 6	Oyster- 3
CZMA/CM- 36	Hurricane- 15	Marsh- 6	People- 3
Governance- 35	Reserve- 15	Rights- 6	Shellfish- 3
Legal/law- 29	Risk- 15	Salmon- 6	Shoreland- 3
Recreation- 28	Tropical- 15	Endangered Spec- 5	Tsunami- 3
Sea Level Rise- 28	Restoration- 14	Manatee(s)- 5	Bycatch- 2
Adaptation- 27	Hazard- 13	Mapping- 5	Demographic- 2
Regulations- 27	Boating- 12	Marine Park- 5	Future Generation- 2
Ecosystem- 26	Capacity- 12	Native/indigen- 5	Infrastructure- 2
Oil, gas, petrol- 24	Fishermen-12	Permits- 5	Jellyfish- 2
Port/seaport- 24	Outer Cont Shelf- 12	Resort/Vacay- 5	Lobster- 2
Wetlands- 23	Pollution- 11	River- 5	Marine mammals- 2
Climate change- 22	Sanctuary- 11	Whales- 5	Mangrove- 2
Protection- 22	EcosystemServices10	Amenities- 4	Nature- 2
Land use- 21	Resilience- 10	Intergovernmental- 4	Religion -2
Agriculture- 20	Value- 10	Maritime- 4	Residents- 2
Resource mgmt- 20	Biodiversity- 9	NOAA- 4	Shark- 2
Water quality- 20	Catch Share- 9	Scuba- 4	Shrimp- 2
Shoreline- 19	Nat'l/state parks- 9	Sediment- 4	
Urban/metro- 19	Stakeholder- 8	Storms- 4	

**EBM/EBFM stands for Ecosystem-Based Management/Ecosystem-Based Fisheries Management*

These 118 Topics fall into nine main Categories (See Table 2): Law, Policy and Planning; Governance, Management and Protection; Human Dimensions; Habitat and Ecosystems;

Economics; Weather, Climate and Climate Change; Coastal Land; Science and Biology; and Fisheries.

Table 2- Topics That Fall Within Categories of Papers Published by CMJ

Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Category 7	Category 8	Category 9
Law Policy Planning	Governance Management Protection	Human Dimensions	Habitat Ecosystems	Economics	Climate & Climate Change	Coastal Land	Science Biology	Fisheries
Policy	MPAs	Community	Coral Reefs	Economics	Sea Level Rise	Beach(es)	Science	Fisheries
Legal/law	Governance	Opinion/Atts	Estuary	Oil/gas/pet	Adaptation	Land Use	Water Qual	Aquaculture
CZMA	Protection	Recreation	Ecosystem	Nat Resource	Climate Change	Shoreline	Pollution	Catch Share
Regulations	EBM/EBFM	Port/Seaport	Wetlands	Energy	Vulnerability	Spatial	Endangered	Salmon
Act(s)	Reserve	Urban	Habitat	Out ConShelf	Hurricane	Erosion	Turtle	Bycatch
Permits	Restore	Participation	Tropical	Eco Services	Risk	Island(s)	Manatee	
Rights	Hazard	Tourism	Biodiversity	Value	Storms	Mapping	Whale	
Intergovern	Capacity	Shipping	Maritime	Cost		Dunes	Crab	
NOAA	Sanctuary	Access	Nature			Lagoon	Oyster	
	Resilience	Boat	Mangrove			Marsh	Shellfish	
	Parks	Fishermen				River	Jellyfish	
	Marine Park	Waterfront				Sediment	Lobster	
		Dredge				Shoreland	M. Mammal	
		Expert				Tsunami	Shark	
		Government				Geography	Shrimp	
		Political						
		Stakeholder						
		Heritage						
		Resort						
		Waste						
		Indigenous						
		Amenities						
		Scuba						
		Surfer						
		Women						
		People						
		Agriculture						
		Armoring						
		Culture						
		Demographic						
		Religion						
		Future						
		Residents						
		Communication						

Category 1

The category of **Law, Policy and Planning** includes several of the most broad and commonly identified topics. The topics within this category include Policy (the most frequently identified topic) Planning, Legal/law, Regulations, Act(s), Permits, Rights, Intergovernmental and NOAA. These topics were identified a total of 224 times. It is logical that a journal dedicated to the concept of Management and Managing would be heavily focused on Policy and Planning. Because this focus has been so consistent throughout the entire publication history of CMJ, no unique trend has been identified for this category.

Within this broad category, when it comes to the topic of Policy, one volume in particular (Volume 40, published in 2012) was rather policy heavy, as it featured a Theme Issue titled *National Oceans Policymaking: Practices and Lessons*. That Theme Issue published ten policy-specific papers (out of a total of 78 listed within the topic grouping) that focused on policymaking from seven different countries or global regions.

Category 2

The category of **Governance, Management and Protection** represents topics that were identified a total of 222 times. This category includes the identified topics of Marine Protected Areas or MPAs (the third most commonly identified topic), Governance, Protect/Protection (identified separately from MPAs), Ecosystem-Based Management or Ecosystem-Based Fisheries Management, Reserve(s), Restore/Restoration, Hazard, Capacity, Sanctuary, Resilience, (land-based) Parks (which includes National, State and Local parks) and Marine Parks. The topics within this category are grouped together because they are all related to practices of governing, protecting or managing marine areas. MPAs, various Parks, Sanctuaries, and EBM/EBFM are all forms of marine protection; The concept of “restore/restoration” is a goal of protect/protection, while “governance” is a method of said protection. The topics of Hazard, Capacity and Resilience fall within this category because they pertain to the importance of marine protection.

When it comes to the individual topics, even though Marine Protected Areas (MPAs) is an incredibly popular topic among the published papers of CMJ, this is a relatively new trend. The first MPA-specific paper that CMJ published was from Volume 14, titled *Marine and Coastal Protected Areas in Latin America: A Preliminary Assessment* (Silva and Desilvestre, 1986). However, 54 of the 61 MPA papers (88.5%) have been published within the last two decades. Volume 38 (2010) included seven MPA papers while Volumes 30 (2002) and 45 (2017) each included six MPA papers (only the latter contained an MPA-specific Theme Issue). This trend identified with CMJ has also been identified by other media, as the popularity in the use of MPAs to protect coastal areas has grown throughout the past several years (Wells, et al., 2016).

Within this category, the identified topic of Governance (with 35 unique identifications) is associated with a Theme Issue published in Volume 41 (2013) titled *Marine Environmental Governance*, which included five Governance papers.

Ecosystem-Based Management/Ecosystem-Based Fisheries Management (EBM/EBFM) is another rather newly trending topic of discussion within the pages of CMJ. While the first EBM/EBFM paper was published in Volume 24 (1996) (titled *An Ecosystem-Based Approach to Managing Estuaries: An Assessment of the National Estuary Program* by Imperial and Hennessey) of fifteen such identified papers, fourteen have been published since Volume 36 (2007-2008). A similar pattern has been identified with the topic of Resilience, of which ten papers have been identified. The first “Resilience” paper was published in Volume 13 (1986), but the remaining nine have all been published since Volume 38 (2010).

Category 3

Human Dimensions includes the greatest number of identified topics of any category, with a total of 352 identifications, spanning 34 topics. This category includes the topics of Community, Opinion/Perceptions/Attitudes, Recreation, Port/Seaport, Urban/Metropolitan, Participation, Tourism, Ship/Shipping, Access, Boat(s)/Boating, Fisher(men)/Fishing, Waterfront, Dredge, Expert, Government, Stakeholder and Political, as well as more sparsely identified categories such as Heritage, Resort, Waste, Indigenous, Amenities, Scuba, surfer, Women/Gender, People, Agriculture, Armoring, Culture, Demographic, Religion, Future, Residents and Communication. All of these identified topics have to do with the actions of human beings, whether that be at the individual level, community level, or at a broader level that is meant to be applied to humanity in general. The twelve identified papers that correlate with the topic of "Fishermen" involve the individual lives, livelihoods and/or opinions of a small number of people; for this reason, "Fishermen" as a topic was included within the Human Dimensions category, and not within the "Fisheries" category that relates to large-scale fisheries or the practice of large-scale fishing.

Stakeholder is a relatively new topic for CMJ, as it was not seen among CMJ published titles until Volume 34 (2006, authored by Rockloff and Lockie). A similar trend exists for the topic of "Expert," which wasn't identified among CMJ titles until Volume 32 (Dietz et al, 2004). Of the twelve identified papers that discuss Fishers, Fishermen or Fishing (meaning small-scale, more recreational-based fishing; which is how it differentiates from the topic of Fisheries), nine have been published within the past fifteen years (since Volume 32).

Category 4

Habitat and Ecosystems contains the identified topics of Coral/Coral Reefs, Estuary/Estuaries, Ecosystem, Wetlands, Habitat, Tropical, Biodiversity, Maritime, Nature and Mangrove for a total of 187 topic-related identifications.

Within this category, of the 46 Coral-Reef-topic-identified papers, ten are about coral reefs in Australia. Estuary is among the most identified topics within this category, but a full two-thirds of the Estuary-related papers were published prior to year 2000. A staple term among conservation movements (Humphries et al, 1995), as identified for the purposes of this paper, the topic Biodiversity wasn't published within CMJ until Volume 19 (Beatley, 1991).

Category 5

When considered as a topic, **Economics**, with 70 unique identifications, is the second most common topic published in CMJ's history. As category, Economics includes the additional topics of Oil, Gas and Petroleum; Energy; the Outer Continental Shelf, Ecosystem Services, Value and Cost for a sum total of 146 identifications. These topics are grouped together because they all

pertain to monetization or natural resources, without falling into the other identified categories (i.e. fisheries).

Roughly twelve percent of the papers identified within the topic of Economics (8 papers in total) were published in a single volume (Volume 36, 2007-2008), which featured a special Theme Issue titled *Economics of Ocean Observing Systems* (edited by Kite-Powell, Colgan and Weiher). Of the 24 Oil, Gas and Petroleum papers published, 21 were published before year 2000. The topic appears to be trending downward. CMJ has published only one petroleum-related paper since 2007. Five of the sixteen papers that have been identified as being about Energy have focused on Offshore Wind. This appears to match the global trend of petroleum-based energy sources seeing a decrease in growth, compared to more renewable sources of energy (Managi et al., 2004).

Another identified trend in this category has to do with papers relating to the topic of the Outer Continental Shelf (OCS). Most of those papers have to do with drilling for petroleum-related energy sources, or with other natural resources that have large economic value. A total of twelve papers have been identified under this topic, with eleven of them being published within the range of Volumes 2 and 16 (1975-1989), averaging almost one per year. However, only one OCS-related paper has been published on the subject since 1989. That paper was published in Volume 46, titled *A Review of Coastal States' Comments on BOEM's Outer Continental Shelf Draft 5-Year Program* (Laschever, 2018). Of the ten identified papers that focus on (and specifically mention) the topic of Ecosystem Services, four were published prior to 1983, with the remaining six not published until year 2016 or later. Additionally, four of the identified Ecosystem Services papers were published in a Theme Issue in Issue 4, Volume 46 (2018), titled *Applying Ecosystem Services to the Practice of Coastal Management: Understanding Values, A Special Issue from The Coastal Society*.

Category 6

Category 6 is **Weather, Climate and Climate Change**. This category contains the topics of Sea Level Rise, Adaptation/Adapting, Climate Change/ (Global) Warming, Vulnerability/Vulnerable, Hurricane(s), Risk and Storms, with a total of 126 topic-related identifications.

Perhaps the most consistent topic-related trend within CMJ has been the rise of Climate-Change-related papers that have been published, along with the concepts of coastal areas being particularly Vulnerable (having Vulnerability) to such changes, as well as the need to Adapt (a need for Adaptation) and a need to mitigate Risk. Along with those topics come the concept of an increase in the frequency and strength of Hurricane(s) and other Storms.

The concept of Sea Level Rise was first identified among CMJ's published papers in Volume 14, in a paper titled, *Greenhouse Effect, Sea Level Rise and Coastal Zone Management* (Titus, 1986). Each decade since has seen an almost evenly distributed number of sea-level-rise-related paper publications. However, it is the topic of needing to "adapt" (grouping the identified topics of Adapt, Adaptation and Adapting all together) that has seen a substantial increase over the past

two decades. Of the 26 Adapt papers published, 24 of them have been since year 2000. The same can be said of Climate Change and Warming papers. Of those 22 identified papers, 20 have been published since 2004 (only two were published before year 2000). The trend continues with the identified topic of Vulnerability. Of those sixteen identified papers, only two were published before year 2000.

Category 7

Topics related to **Coastal Land** make up this category and include Beach(es), Land Use, Shoreline, Spatial and Erosion, as well as less frequent topics such as Island(s), Mapping, Dunes, Lagoon, Marsh, River, Sediment, Shoreland and Tsunami. The total number of times that these topics were identified within this category is 172.

Ten percent (six papers) of Beach papers (out of a total of sixty) are specific to beaches in one country: Australia. Within the Land Use topic, only two papers (out of twenty) related to Land Use have been published since 1995. They are *Coastal Ecosystems and Agricultural Land Use: New Challenges on California's Central Coast* (Stuart, 2010) and *An Assessment of Coastal Development and Land Use Change Using the DPSIR Framework: A Case Studies from the Eastern Cape, South Africa* (Palmer et al., 2011). The remaining ninety percent of Land Use papers were published in year 1995 or earlier.

When identifying trends within the topic of Spatial, the vast majority of the Spatially-related papers are associated with modeling, data or GIS systems. Only two of the eighteen papers specifically focus on the concept of Marine Spatial Planning. Those two papers are *A Marine Spatial Planning Approach to Select Suitable Areas for Installing Wave Energy Converters (WECs), on the Basque Continental Shelf (Bay of Biscay)* by Galparsoro et al. (2012) and *Stakeholder Perspectives on the Value of Marine Spatial Planning Towards Advancing Offshore Wind in the U.S.* by Ryan et al. (2019). While the topic of Marine Spatial Planning is a growing area of interest among the general practice of Coastal Management (Jones, Lieberknecht and Qiu, 2016; Douvere, 2008; Ritchie and Ellis, 2010), it was not a focus among CMJ published papers prior to year 2012. The two papers that mention Marine Spatial Planning within their titles are similar enough in scope to the other spatially-focused papers within this topic to not require a separate topic for Marine Spatial Planning.

Category 8

The category of **Science and Biology** includes the second-longest list of topics, including Science, Water Quality, Pollution, Turtles, Endangered Species, Manatees, Whales, Crabs, Oysters, Jellyfish, Marine Mammals and Sharks, which were identified a combined total of 90 times. All topics related to specific animals (biology), chemicals (pollution/water quality) and/or science (science as a topic or as it pertains to chemicals) were included within this category.

The publication of species-specific, animal-related papers is a growing trend, with almost all of the published papers that focus on specific species being published after year 2000. CMJ's first

paper related to the topic of Turtles was published in Volume 22 (Sloan et al., 1994). Only seven Turtle papers have been published since then, but two were within the past year, with five of the seven being from year 2000 or later. Three separate Crab-related papers were published in Volume 34 (2006), yet Crab-focused papers appear in no other year. Manatee-related papers were not published within CMJ until Volume 31 (2003) (by Sorice, Shafer and Scott), but since then the topic has seen five articles. The topic of Whales follows a similar trajectory, with the first Whale-specific paper being published in Volume 30 (2002), with five whale topics being published since that time (authored by Orams).

Continuing on an increasing trend in animal-related publications, CMJ's first paper published under the topic of Jellyfish was published in 2010 (Gershwin et al.), with a second one following in 2017 (Tiller et al.) and a third in 2018 (Kingsford et al.). The topic of Sharks follows a similar trajectory, with the first Shark paper being published in 2012 (Neff) and the second in 2014 (McPhee).

Maritime-bird-related papers follow this same trend of being a much more recent focus. CMJ's first bird-specific paper was published in 1991 (Melvin, Griffin and Maciyor), yet the three that make up the rest of this topic were all published in year 2012 or later. Oyster-related papers have a similar pattern, with the first paper being published in 1986 (authored by Bakalian), and the remaining two coming much later, in 2007 (Carrasco et al.) and 2012 (Tissot), respectively.

Category 9

Fisheries make up the fourth most common identified Topic (with a total of 60 identified Fisheries papers), yet when considered as a Category., Fisheries is by far the smallest Category, with the only other Topics joining Fisheries (as a topic) to make up a larger Category being Aquaculture, Catch Share, Salmon and Bycatch.

The first identified Catch Share paper was not published until 2012. Seven of the nine total Catch Share papers were published in a 2018 Theme Issue (edited by Lisa Pfeiffer) entitled *Outcomes of the West Coast Groundfish Trawl Catch Share Program: The First 5 Years*. Ten percent (a total of six papers) of the Fisheries (topic) papers were published in Volume 37 (2009), though that pattern is not correlated with a specific Theme Issue.

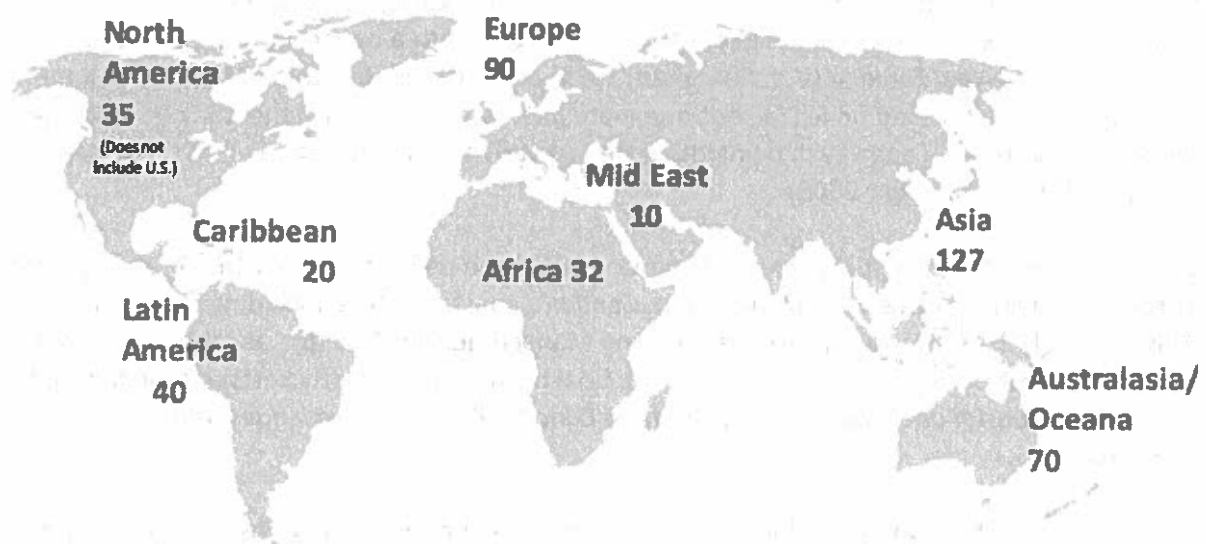
International Trends

One of the most significant trends seen in CMJ over the course of its publication history has been the substantial increase in the number of papers it has published about Coastal Management issues in countries other than the United States. During the first five years (1973-1977) of CMJ's history, it published 29 papers that were specific to individual U.S. states and only 5 papers that were specific to other countries. (The rest of the papers published were more general or broad in nature, in terms of their geographical implications.) However, during the previous five years (2015-2019), CMJ has published roughly the same amount of U.S.-state-

specific papers (26 in total) but has also published 56 papers that focus on other countries, a more than tenfold increase over the same amount of time.

The region that has seen the most representation in the pages of CMJ has been Asia, with 127 Asia-related papers identified; followed by 90 for Europe; 70 for Australia, New Zealand and Oceania; 40 for Latin America (which includes Mexico); 33 for Africa; 20 for the Caribbean; and 10 for the Middle East. Canada is the lone country representing North America in this scenario. It is also the second most common country contributing to CMJ, with 35 published papers. (See Figure 1)

Figure 1- Representation of International Regions Among CMJ Articles



Total international representation, broken down by region, in terms of number of publications

**In this scenario (of international papers), the only country representing North America is Canada*

The continent of Africa represents one of the least represented regions within CMJ, but it has also been trending upwards within recent years. 29 of the 32 total papers from Africa have all been published from year 2000 through the present. The most represented African country is South Africa, with eight published papers, followed by Kenya and Tanzania with six papers each.

The bulk of Asia's representation within CMJ comes from the Philippines and Indonesia. Of the 22 papers from the Philippines, 21 have been from year 2004 onward, while eleven of Indonesia's sixteen papers have been from year 2000 onward. The reason for these trends likely has to do with personal connections between the editors of CMJ and researchers in those areas, especially with regards to current Editor-In-Chief Patrick J. Christie, who himself has done extensive research in the area (Pew Trusts, 2019; including publications in the journal *Society*

and Natural Resources in 1994, *Journal of Environmental Management* in 2002, *Coral Reefs* in 2007 and *Current Opinion in Environmental Sustainability* in 2016). However, a recent increase in publications is a trend that can be seen throughout the entire Asia region. CMJ has published a total of nineteen papers representing China, with sixteen of them being from 2002 or later; of the nine Korean papers published, eight have been from 2003 or later; of the nine Taiwanese papers published, eight have been from year 2007 forwards. All six of Thailand's papers have been from year 2000 onwards. The only Asian nation with a reverse trend within the pages of CMJ is Japan, which has a total of thirteen papers published. Only five of Japan's papers have been from 2004 or later. Eight of Japan's papers were published between years 1980 and 1995, with four of them being a part of a 1984 Theme Issue.

From the Australasia/Oceania region, the most commonly contributing country within CMJ, by far, is Australia, with a total of 45 publications. Roughly one quarter of Australia's papers have focused on Coral Reefs, the Great Barrier Reef in particular. Geographically next door to Australia, New Zealand was the first country represented, with a paper titled *Coastal Land Management in New Zealand* (V. J. Chapman, 1974) being included within CMJ's first volume. Four papers have focused on Fiji (all but one were post-year 2000), with the Cook Islands, the Solomon Islands and Tonga each being published a total of two times (with all of those papers being published since year 2000).

Canada is the second most represented country within the pages of CMJ (with 35 total papers). Three Theme Issues have been dedicated to Canada's coastal waters, including one from Volume 11 (1983-1984; specific to Coastal Zone Management in Canada), another from Volume 35 (2007; about Canada's Oceans Act) and the final from Volume 39 (Ricketts and Hildebrand 2011; titled *Coastal and Ocean Management in Canada: Progress, Challenges and Opportunities*).

Europe's representation in CMJ has as much to do with geographical regions or groups within the continent as it does with individual nations. The most represented nation is the United Kingdom, with a total of sixteen published papers, followed closely by papers that pertain to the entire European Union or Eurozone, with a total of fourteen papers. Spain has seen a total of twelve publications, with the Mediterranean region being the focus of nine papers, followed by Norway, which has eight papers. Greece and Ireland have a total of six papers each. Several European nations have had a total of one paper each published about them, in all of CMJ's history. These include Croatia (Cvitanic, 1999), Denmark (Parnell and Kofoed-Hansen, 2001), Estonia (Riggs, 1994) and Iceland (Chambers and Kokorsch, 2017).

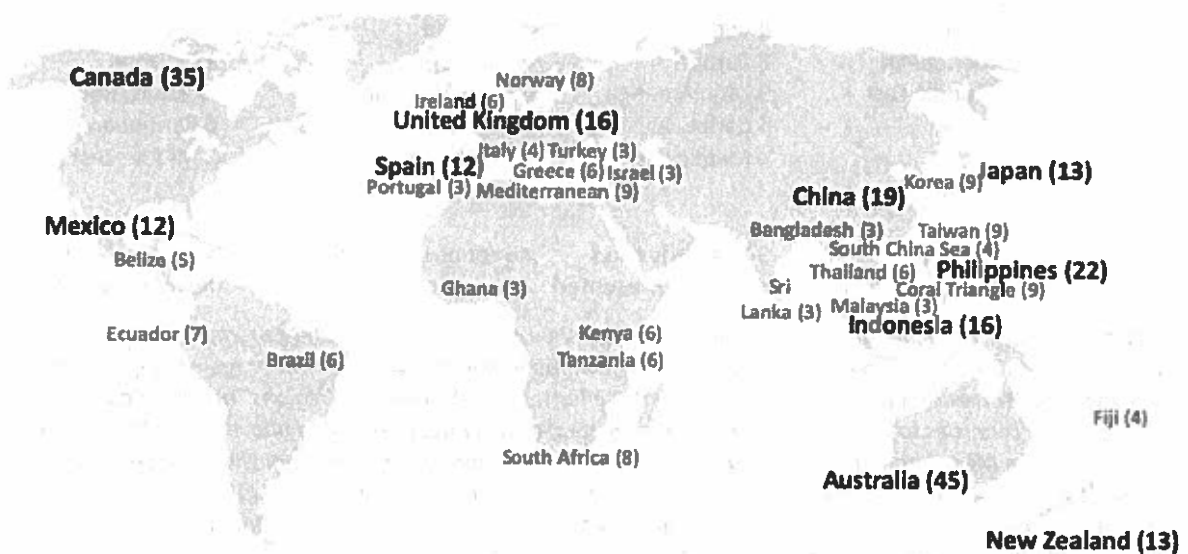
In the Latin American region, Mexico has seen the most articles published, with a total of twelve, followed by Brazil (with six), Belize (with five) and Ecuador (with four, though if the Galapagos Islands are included within Ecuador, their representation jumps to seven). Latin America has seen steady representation throughout the decades, with eleven of its 40 papers being published in the 1980s, nine being from the 1990s, eight from the 2000s and twelve from the 2010s.

The Caribbean region has seen twenty articles published about the region as a whole, with the majority of those papers focused on governance- and beach- related issues. The Bahamas, Turks and Caicos and the West Indies have each been the focus of two published papers.

The Middle East is the least represented region within the pages of CMJ. A total of three published papers have focused on Israel, another three on Turkey, two on Kuwait, and one each for the Caspian Sea and Lebanon's stretch of the Mediterranean Sea

See Figure 2 for a map of the most frequently represented countries. See Table 3 for a chart that depicts International representation among CMJ published papers on a per decade basis.

Figure 2- Most Frequent Countries (not including USA) for CMJ Articles



The ten most represented countries, in terms of number of publications

The remaining 24 most identified countries and regions, in terms of number of publications

Table 3- Total Numbers of International Papers Published by CMJ per Decade, including a breakdown of geographical representation

<u>1970s</u>	<u>1980s</u>	<u>1990s</u>	<u>2000s</u>	<u>2010s</u>
6	43	65	162	145
2 Australasia 4 Europe	7 Asia 8 Australasia 8 Canada 8 Europe 10 Latin America 1 Caribbean 1 Middle East	3 Africa 17 Asia 15 Australasia/ Oceania 4 Canada 8 Europe 9 Latin America 5 Caribbean 4 Middle East	12 Africa 55 Asia 24 Australasia/Oceania 13 Canada 40 Europe 8 Latin America 8 Caribbean 2 Middle East	17 Africa 47 Asia 22 Australasia/ Oceania 10 Canada 28 Europe 12 Latin America 6 Caribbean 3 Middle East
5 countries represented	17 countries represented	34 countries and regions represented	46 countries and regions represented	48 countries and regions represented

This chart depicts the number of international papers published each decade, with the geographical areas represented by those publications listed underneath. The number of individual countries or regions represented within the broader areas mentioned above is listed at the bottom. At the bottom, "regions" are included within the list of identified countries to mean smaller geographical breakdowns than those listed above it as "areas". This would include the Mediterranean region that is listed within the larger area of Europe, or the Coral Triangle or South China Sea regions that are listed within the larger geographical area of Asia. It would not be correct to label these smaller geographical regions as countries, but also not correct to include them separately among the continents and broader geographical areas mentioned above them.

U.S. State and Regional Trends

Within the United States (see Figure 3 for details), CMJ has published papers from almost every state that has a coastal boundary. California (with a total of 56 papers) is the most represented state by far. Almost every volume has seen at least one California-related paper published. Washington State is second (with a total of 27 publications). Washington's popularity within the journal is not necessarily because it is the state where CMJ (and its editors) are based; it is equally likely that Washington's prominence stems from the fact that Washington was the first state to ratify the CZMA back in 1976 (Department of Ecology, State of Washington, 2019), making it a state with one of the most robust Coastal-Management-related histories.

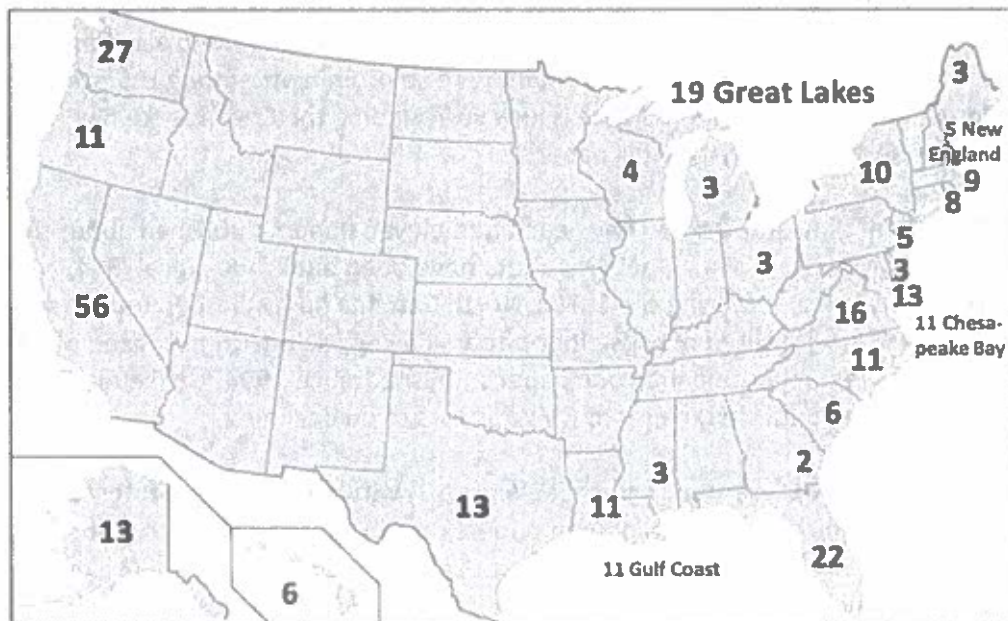
Florida is the third most represented U.S. state, with 22 publications, followed by Virginia with sixteen. Alaska has a total of thirteen publications, with nine of those being from year 2006

onwards, making coastal issues from Alaska one of the more prominent U.S.-state-specific trends. Texas also has thirteen total publications, but it has a trend that is a reverse of Alaska, with nine of Texas' papers being published in year 1993 or prior. Maryland also has thirteen papers, but the reason that Maryland and Virginia are so prominent among U.S. states is because almost all of their papers focus on issues surrounding the Chesapeake Bay (there are a total of eleven Chesapeake-Bay-specific papers).

Louisiana, North Carolina and Oregon have each had eleven papers published about their coastal waters. Only two Louisiana-specific papers have been published since 1994, with five of their papers being published during the 1970s. North Carolina has only seen four papers published since 1998, with three of those four papers having to do with hurricane risk and/or storm mitigation. Oregon has only had one paper published since 1994. Unlike Alaska, its prominence within the published pages of CMJ appears to be declining.

The most prominently represented region (See Figure 3) within the United States is the Great Lakes region, about which a total of nineteen papers have been published (though two of those nineteen were from the Canadian side of the Great Lakes region). Because of the prominence of the Great Lakes within the U.S. Coastal Management field, CMJ has actually published more Wisconsin-specific papers (a total of four) than papers from Gulf of Mexico states like Mississippi (which has three papers) and Alabama (which hasn't had a single paper published in CMJ). Even states such as Michigan and Ohio have each been published three times, while the Atlantic coastal state of Georgia has only seen two publications.

Figure 3 Frequency of Articles Referencing U.S. States and Geographical Regions



Legend: Blue numbers and text depict the U.S. states and regions with the most frequently contributed articles to CMJ, while green numbers and text represent the rest of the state- and regional-specific U.S. papers that have been published by CMJ.

Discussion

Identification and analysis of trends

Coastal Management Journal has seen a variety of trends throughout its 47-year publication history. The most prominent trend has been a substantial and continued growth in the amount of non-U.S. specific articles that CMJ has published. CMJ's initial focus was stated to be on Coastal Management issues within the United States, however its publication of internationally-focused papers has increased with each new decade. This is in line with the findings of other researchers.

In 1998, Cicin-Sian and Knecht wrote that "The United States initiated one of the first formal efforts with its Coastal Zone Management Act of 1972... Shortly after initiation of the CZM program in the United States, coastal management efforts began in a number of other countries." This increase of Coastal Management (as a field) awareness around the globe was initiated by the United Nations and then carried out by individual nations (Cicin-Sian and Knecht, 1998). That growth became apparent in the 1990s (Sorensen, 1993) and continues through present day (Clark, 1997). The continued increase in the number of international papers published by CMJ reflects this global, well-established trend. The fact that the publication of papers that focus on coastal issues from developing (in terms of their economies) nations has only started to happen over the past two decades suggests that this trend will

continue and possibly increase in the years to come. The majority of CMJ papers that focus on issues in Africa, Asia and Latin America have been published post-year-2000.

As these shifts have happened within the field of Coastal (Zone) Management over the past five decades, they have mirrored the predictions and assessments of the United Nations, that a need for Coastal Management and Integrated Coastal Management programs would only increase worldwide (FAO Legislative Study 93, page 3). Coastal Management Journal's more than tenfold increase in the proportion of international papers that were published within its pages (when comparing their first five years with the previous five years) are a reflection of this global trend. The number of newly-represented countries and global regions within the pages of CMJ over the past two decades is another reflection of this global shift.

Other major trends identified within this paper have to do with the increase in the number of papers that discuss climate change and sea level rise, as well as the emergence of popular management practices such as the designation of Marine Protected Areas. These trends reflect the fact that the field of Coastal (Zone) Management itself is an evolving one (Birch and Reyes, 2018).

With regard to climate change, it is well understood that a changing climate and the need to adapt to the associated new circumstances will be a major theme within the Coastal Management field for the foreseeable future (Rau, McLeod and Hoegh-Guldberg, 2012; Klein et al., 2001; Nicholls and Klein, 2005). In 1993, Vellinga and Klein stated that "As a starting point for coastal zone management, the assessment of a country's or region's vulnerability to accelerated sea level rise is of utmost importance." This importance is reflected within the publication history of CMJ, as more than ninety percent of climate-change-related papers have been published since year 2000. Furthermore, this trend, itself, was the subject of a paper that CMJ published in 2010, titled *Practicing Coastal Adaptation to Climate Change: Lessons from Integrated Coastal Management* (Tobey et al.).

The importance of creating Marine Protected Areas (MPAs) has been heavily promoted by the United Nations (UN Environment Programme, 2019). This could help to explain why the number of MPA-related papers has been a more recent trend, with nearly ninety percent of CMJ's MPA-related papers being published since year 2000. Other researchers have noted the increased awareness and implementation of MPAs since year 2000, including Pomeroy et al. (2005) and Peter J.S. Jones (2014) who charted the increasing popularity in the discussion of MPAs among academic papers in the book *Governing Marine Protected Areas: Resilience Through Diversity*. Jones states that "There were, on average, less than 10 papers a year related to MPAs in 1980-1989, but this grew to an average of nearly 60 a year in 1990-1999 and over 300 a year in 2000-2009, rising to ~570 papers in 2012." Jones's analysis of the rising trend of MPAs as a popular topic among ocean- and coastal-related issues mirrors the publication pattern of MPA-related papers within the pages of CMJ.

Conclusion

This paper analyzes the topics and trends in topics over the publication history of Coastal Management Journal. It identifies topics among its published papers, as well as broader trends in topics that have been covered by the journal. These topics and trends reflect how the field of Coastal Management -as a whole- has changed and continues to evolve. The journal has continued to grow in international scope over time, with each new decade surpassing the last either in the number of international papers published and/or in the number of countries and geographical regions represented among its pages. The number of topics covered by the journal have also continued to grow and change as growth and changes have occurred in the broader Coastal Management field.

Within the pages of CMJ, the 1970s saw a focus on broad CZMA papers and a focus on the United States. The 1980s saw an expansion of representation from individual U.S. states, with a slight focus on Latin America. The 1980s also saw a focus on papers that focused on issues surrounding the Outer Continental Shelf, while both the 1980s and 1990s contained more Oil, Gas and Petroleum-related papers than other decades. The 1990s also saw a substantial increase in the number of papers published about coastal-related issues in Asia, as well as the first papers representing Africa. Both of those trends would only continue to grow during the 2000s.

By the time the 21st century came around, international papers were as commonly published as papers specific to U.S. states (sometimes even more common). Climate change and sea level rise papers saw a substantial increase in representation, as did papers related to Marine Protected Areas and marine animals, ranging from marine mammals to sea turtles to jellyfish.

Of the most commonly published identified topics throughout CMJ's history, the majority of them focus on policy, the need to protect or manage our coasts, as well as economic-related topics. However, the most common thread found amongst all 118 identified topics is humanity or Human Dimensions, which at the identified topic level appears a total of 34 times. The popularity of Human Dimensions-related issues amongst the topic identifications is an accurate representation of founding Editor-In-Chief Marc J. Hershman's initial introduction, in which he asked "How do we measure the immeasurables of aesthetics, scenic qualities and quietude?... How do we determine the desires of the people?"

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